AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A microfluidic device manufactured by binding a sensing substrate including a sensing electrode, an electrode interconnect, and an electrode pad formed on a top surface of the sensing substrate, the sensing electrode, electrode interconnect and electrode pad having a planar structure, with a channel substrate including at least two fluid inlet ports, a chamber, and a channel, the chamber and the channel formed on a surface of the channel substrate~~,~~;

~~wherein a first fluid injected via one of the fluid inlet ports flows by natural capillary force, and a second fluid injected via another fluid inlet port flows by an external pump, and~~

wherein the sensing substrate and channel substrate are bound at each channel and chamber to ~~prevent leakage of the injected fluids~~form a capillary channel; and

an external pump, wherein the capillary channel and the external pump control a flow of a first fluid and a second fluid such that a first fluid injected via one of the fluid inlet ports flows by natural capillary force, and a second fluid injected via another fluid inlet port flows by the external pump.

2. (Currently Amended) The microfluidic device of claim 1, wherein ~~the~~ a first channel path from one of the fluid inlet ports ~~is predetermined up to a sight of designation and wherein~~ and a second channel path from the other fluid inlet port intersect at a site of designation such that the first fluid flows along the first channel path up to the site of designation by capillary force, and the second fluid flows along the second channel path up to the site of designation by the external pump and is forced to push out the first fluid that stays at the site of designation for fluid exchange.

3. (Previously Presented) The microfluidic device of claim 1, wherein the fluid inlet port and sensing electrode are in fluid communication such that the first fluid is injected as a sample after the immobilization of biological/chemical substances on the sensing electrode, and the reaction product between the first fluid and the biological/chemical substance is electrochemically detected.

4. (Original) The microfluidic device of claim 1, wherein the sensing substrate further comprises recesses to correspond to the multiple fluid inlet ports, the chamber, and/or the channel.

5. (Original) The microfluidic device of claim 1, wherein one of the sensing substrate and the channel substrate is formed of a hydrophobic material and the other is formed of a hydrophilic material.

6. (Original) The microfluidic device of claim 1, wherein both of the sensing substrate and the channel substrate are formed of a hydrophobic or hydrophilic material with different degrees of hydrophobicity or hydrophilicity.

7. (Original) The microfluidic device of claim 5, wherein a hydrophobic or hydrophilic material is applied to a local region on the inner surface of the sensing substrate or the channel substrate, with a different degree of hydrophobicity or hydrophilicity with respect to the material composing the corresponding substrate.

8. (Original) The microfluidic device of claim 6, wherein a hydrophobic or hydrophilic material is applied to a local region on the inner surface of the sensing substrate or the channel substrate, with a different degree of hydrophobicity or hydrophilicity with respect to the material composing the corresponding substrate.

9. (Original) The microfluidic device of claim 1, wherein the channel comprises a main channel and a sub-channel branching off from the main channel, and a micro heater is additionally installed in the sub-channel.

10. (Original) The microfluidic device of claim 1, wherein the channel substrate and the sensing substrate are bound together using an adhesive material, are bound using an additional clip-type structure, or are bound by fitting projections formed on one of the channel substrate and the sensing substrate into grooves formed on the other.

11. (Previously Presented) A microfluidic device manufactured by binding a sensing substrate including a sensing electrode, an electrode interconnect, and an electrode pad, with a channel substrate including a first fluid inlet port at a side of the channel substrate, a first fluid

addition chamber around the first fluid inlet port, a sample reaction barrier, a sensing chamber, a second fluid inlet port at the other side of the channel substrate, a second fluid addition chamber around the second fluid inlet port, a channel connecting the second fluid addition chamber and the sensing chamber, and a used reagent reservoir connected to the sensing chamber,

wherein a sample injected via the first fluid inlet port flows into the sensing chamber through the first fluid addition chamber by capillary force and stops flowing at the sensing chamber having appreciably large outlets, and a buffer solution loaded via the second fluid inlet port flows by the action of an external pump, through the channel and the sensing chamber, and is reserved in the used reagent chamber.

12. (Original) The microfluidic device of claim 11, further comprising a reaction chamber and a time delay between the reaction barrier and the sensing chamber.

13. (Original) The microfluidic device of claim 11, wherein the sensing substrate further comprises recesses to correspond to the multiple fluid inlet ports, the chamber, and/or the channel.

14. (Original) The microfluidic device of claim 12, wherein the sensing substrate further comprises recesses to correspond to the multiple fluid inlet ports, the chamber, and/or the channel.

15. (Original) The microfluidic device of claim 11, wherein one of the sensing substrate and the channel substrate is formed of a hydrophobic material and the other is formed on a hydrophilic material.

16. (Original) The microfluidic device of claim 15, wherein a hydrophobic or hydrophilic material is applied to a local region on the inner surface of the sensing substrate or the channel substrate, with a different degree of hydrophobicity or hydrophilicity with respect to the material composing the corresponding substrate.

17. (Original) The microfluidic device of claim 11, wherein both of the sensing substrate and the channel substrate are formed of a hydrophobic or hydrophilic material with different degrees of hydrophobicity or hydrophilicity.

18. (Original) The microfluidic device of claim 7, wherein a hydrophobic or hydrophilic material is applied to a local region on the inner surface of the sensing substrate or the channel substrate, with a different degree of hydrophobicity or hydrophilicity with respect to the material composing the corresponding substrate.

19. (Original) The microfluidic device of claim 11, wherein the channel comprises a main channel and a sub-channel branching off from the main channel, and a micro heater is additionally installed in the sub-channel.

20. (Original) The microfluidic device of claim 11, wherein the channel substrate and the sensing substrate are bound together using an adhesive material, are bound using an additional clip-type structure, or are bound by fitting projections formed on one of the channel substrate and the sensing substrate into grooves formed on the other.